SIEMENS

SIREMOBIL Iso-C 3D

SP

Installation and Startup

System

3D Navigation

Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

The installation and service of equipment described herein is to be performed by qualified personnel who are employed by Siemens or one of its affiliates or who are otherwise authorized by Siemens or one of its affiliates to provide such services.

Assemblers and other persons who are not employed by or otherwise directly affiliated with or authorized by Siemens or one of its affiliates are directed to contact one of the local offices of Siemens or one of its affiliates before attempting installation or service procedures.

Table of Contents 3

Safety information

NOTICE

⇨ **When performing the work steps and tests described herein, observe the product-specific safety information contained in the documents, as well as the general safety information TD00-000.860.01....**

Notes and symbols

Emphasized text in this technical documentation has the following meanings:

⚠ **DANGER**	**DANGER indicates when there is an immediate danger that l e a d s to death or serious physical injury.**
⚠ **WARNING**	**WARNING indicates a risk of danger that m a y l e a d to death or serious physical injury.**
⚠ **CAUTION**	**CAUTION used with the safety alert symbol indicates a risk of danger that leads to slight or moderate physical injury and/ or damage to property.**
NOTICE	**NOTICE used without the safety alert symbol indicates a risk of danger that if disregarded leads or may lead to a potential situation which may result in an undesirable result or state other than death, physical injury or property damage.**

Fig. 1:   Safety Notes

NOTE	• **Steps to be performed are preceded by a bullet point.**
	    - **Indented text under the activity to be performed contains general information.**
	       ⇨ **Results and events are indented and preceded by an arrow.**

NOTE	**Depending on the progress of the configuration, the "Next" button might also be displayed as the "Finish" button.**

General information 7

NOTE	Once the "Save" button has been selected in the individual screens, the message "..... successfully saved" appears following a successful save. Please:
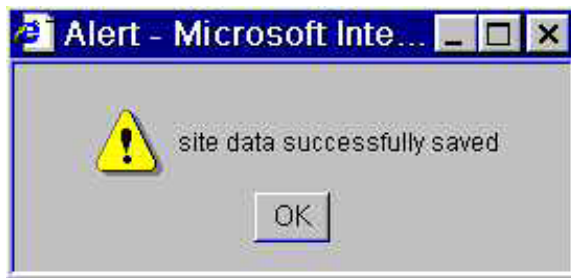
- **Select "OK".**

NOTE	If any problems arise when making changes in the Service UI, attempt to resolve them first by powering the system completely off and then powering it on again.

3D Navigation with the SIREMOBIL Iso-C 3D

The 3D navigation kit is a universal HW and SW interface which controls navigation systems provided by different navigation systems vendors.

The navigation system itself is not provided by Siemens, but always by a navigation systems vendor.

Fig. 2:   Cooperation

Procedure in collaboration with the navigation systems vendor BrainLAB

No time overlap when installing the navigation system

In coordination with the navigation systems vendor BrainLAB, the installation of the Navilink interface and the startup of the navigation system are performed sequentially, with no time overlap of technician service calls.

The navigation systems vendor informs the customer that the SIREMOBIL Iso-C must be prepared for navigation. The customer informs the SIEMENS technician of this and schedules the service call to have the Navilink interface installed.

After the SIEMENS technician has performed the necessary tasks, he or she notifies the navigation systems vendor. The navigation systems vendor schedules its own service call.

The presence of a SIEMENS technician is no longer necessary.

This will prevent waiting periods for the SIEMENS technician as well as for the navigation systems vendor's technician.

For this reason, the procedure described below should be followed.

Tasks performed by Siemens

After the customer has placed the order, the following tasks are performed by SIEMENS:

- Schedule the service call with the customer.
- Check all required system updates and perform any that are still necessary.
- Install the new grid holder on the image intensifier.
- Check latest SW version, and install if necessary.
- Check Navilink license, and install if necessary.
- Configure a default network node.
- Calibrate 3D reconstruction, but without the marker ring installed.
- Fill out and send the fax form to BrainLAB. Enter on the form all data required by BrainLAB.

NOTE	**When BrainLAB receives the fax form, they contact the customer, schedule the service call for installation and startup of the navigation system, and perform all required steps. A SIEMENS technician is no longer required to be on site for this phase.**

Tasks performed by BrainLAB

The following tasks are performed by a BrainLAB technician trained for the Siremobil, without the presence of a SIEMENS technician:

- Install and start up the navigation system
- If necessary, adapt the DICOM network node to the Siremobil Iso-C
- Check network communication between 3D PC and navigation system
- Calibrate 3D reconstruction on Siremobil Iso-C with marker ring installed
- Check 3D high resolution on Siremobil Iso-C
- Create a backup CD
- Turnover to customer, customer briefing

Procedure in collaboration with all other navigation systems vendors

There is a time overlap involving the Siemens technician and the navigation systems vendor's technician

In such cases, the Navilink interface installation can be only partially performed by a SIEMENS technician. Some tasks must be carried out in close cooperation with a technician from the navigation systems vendor.

This means that the SIEMENS technician requires two service calls to integrate the navigation system.

Tasks performed by Siemens

- Schedule the service call with the customer.

Siemens technician (1st service call)

The following tasks must be performed by the SIEMENS technician at the 1st service call:

- Check all required system updates and perform any that are still necessary
- Install the new grid holder on the image intensifier
- Check latest SW version, and install if necessary
- Check Navilink license, and install if necessary
- Configure a default DICOM network node for the navigation system
- Calibrate 3D reconstruction. Only the calibration without the navigation system can be performed, since the navigation system's marker ring is not present.
- Check image quality and 3D high resolution

Joint tasks, performed by Siemens and the navigation systems vendor

The following tasks are performed jointly, with a technician from the navigation systems vendor:

- If necessary, adapt the DICOM network node configuration to the navigation system
- Check network communication between 3D PC and navigation system
- Calibrate 3D reconstruction (with marker ring)

After installation is completed, stow the navigation system test body (included in the Navilink kit) in the monitor trolley.

Inform the customer about the storage location and use of the test body.

The navigation systems vendor turns the navigation system over to the customer and performs the necessary customer briefing.

The overlapping work time of the two technicians is approx. 5 hours.

Overview - flow chart
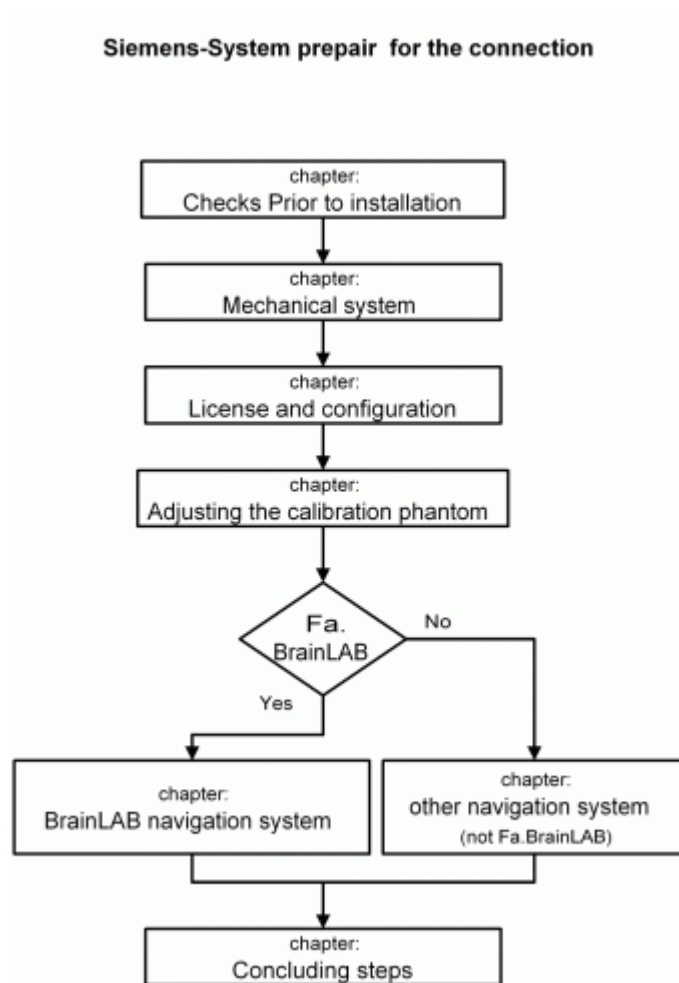
Fig. 3:   prepair the connection

Tools and materials required

Iso-C 3D calibration phantom with navi - material no.: 75 51 620 G5486

NOTE	**The older calibration phantom, material no. 71 39 947 G5486, cannot be used in combination with a navigation system!**

Tool kit

Allen wrench set

Insulating tape

Service PC

Several blank CD-ROMs

Several floppy disks

General information

References

Software description   SPR2-230.815.01

Image Quality quick test   SPR2-230.037.01

Updates

- Check to see whether all necessary system updates have been performed.
- Perform any necessary updates.

Testing the 3D software

Systems with imaging system PC: CELSIUS C650 part no. 71 29 013

- After system start-up, press the key combination "Ctrl-D" on the MEMOSKOP keyboard to switch over to 3D operation.

  ⇨ syngo screen appears on right-hand monitor

- Click "Help"

- Click "About ISO-C 3D..."

- Check to see whether the software "VB00D" appears under "3DSW".

- If the 3D software "VB00D" is installed, continue with the "function control" item

- If the 3D software "VB00D" is not installed, install it according to the instructions found in the document "Software Description SPR2-230.815.01.xx.xx".

- Close the window

Systems with imaging system PC: CELSIUS C444 part no. 77 14 145

- After system start-up, press the key combination "Ctrl-D" on the MEMOSKOP keyboard to switch over to 3D operation.

  ⇨ syngo screen appears on right-hand monitor

- Click "Help"

- Check to see whether the software "VC00B" appears under "3DSW".

- If the 3D software "VC00B" is installed, continue with the "function control" item

- If the 3D software "VC00B" is not installed, install it according to the instructions found in the document "Software Description SPR2-230.815.01.xx.xx".

- Close the window

Function check

- Check that the system functions properly.
- Perform a visual inspection of the 3D navigation kit and of the calibration phantom with the navigation interface to make sure they are in the correct condition.

Replacing grid holder on image intensifier

Fig. 4: I.I._1

- Remove the screws of the grid holder.

Fig. 5:   I.I._2

- Remove the microswitch.
- Cut cable and insulate with insulating tape.

Fig. 6: I.I._3

- Carefully remove grid from grid holder. The gaskets are no longer needed.
- Apply some silicon (20 48 981) to the fitting surface of the new metal grid holder (75 51 703), all the way around, orient the grid correctly, and press it onto the grid holder.
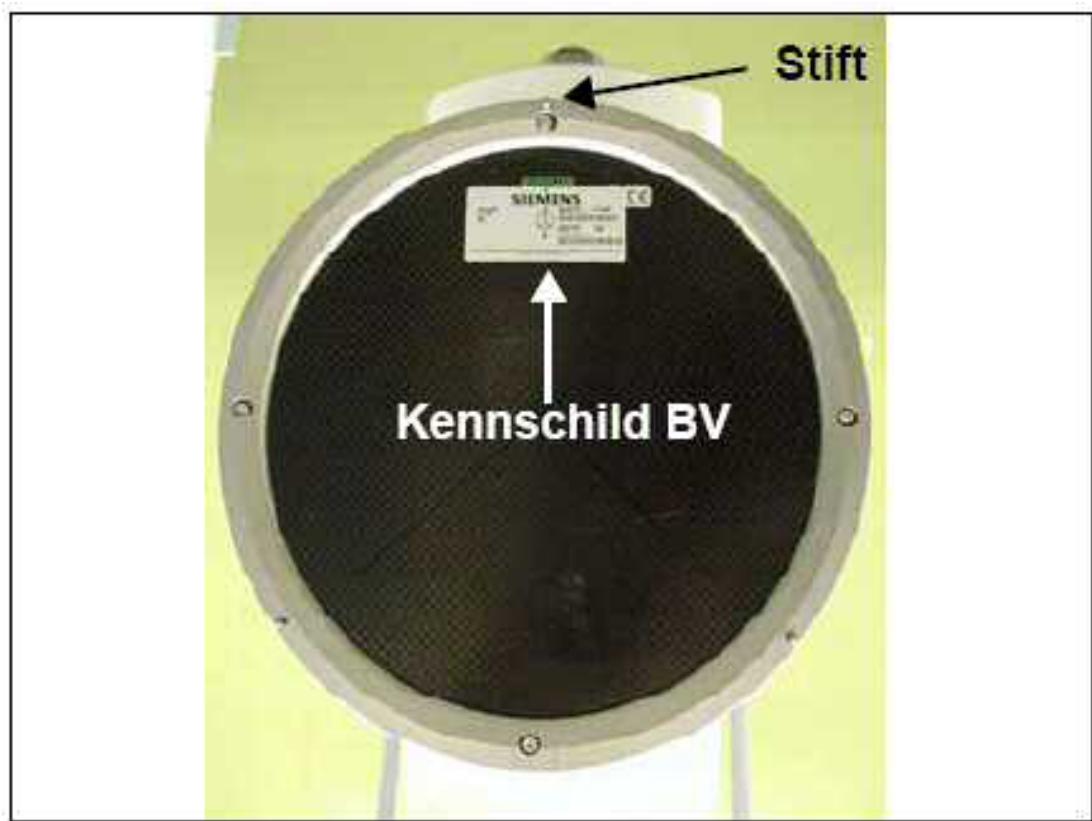
Fig. 7:   I.I._4

NOTE	**The new grid holder has a protruding pin. The grid must be inserted and glued in with its label toward the pin. The new grid holder must be installed with its pin toward the end of the c-arm.**

- Wait for the silicone to harden (approx. 30 min).

- Attach the grid holder to the I.I. and secure it with screws (11 22 571) and contact washers (34 16 66)6.

Attach label to unit

Fig. 8:   ID label

- Attach the included label (75 51 828) to the unit as shown in the illustration.

Licensing

Loading the license

- After system start-up, press the key combination "Ctrl-D" on the MEMOSKOP keyboard to switch over to 3D operation.

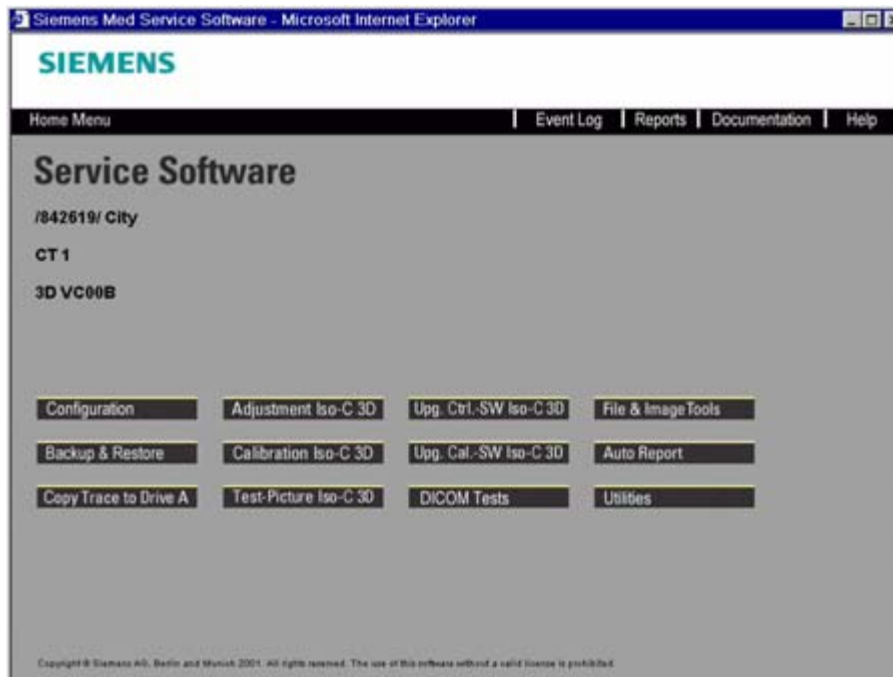   ⇨ syngo screen appears on right-hand monitor

- Open syngo service software

Fig. 9:   Service Software Home Menu

- Click "Configuration".
- Click "Next".
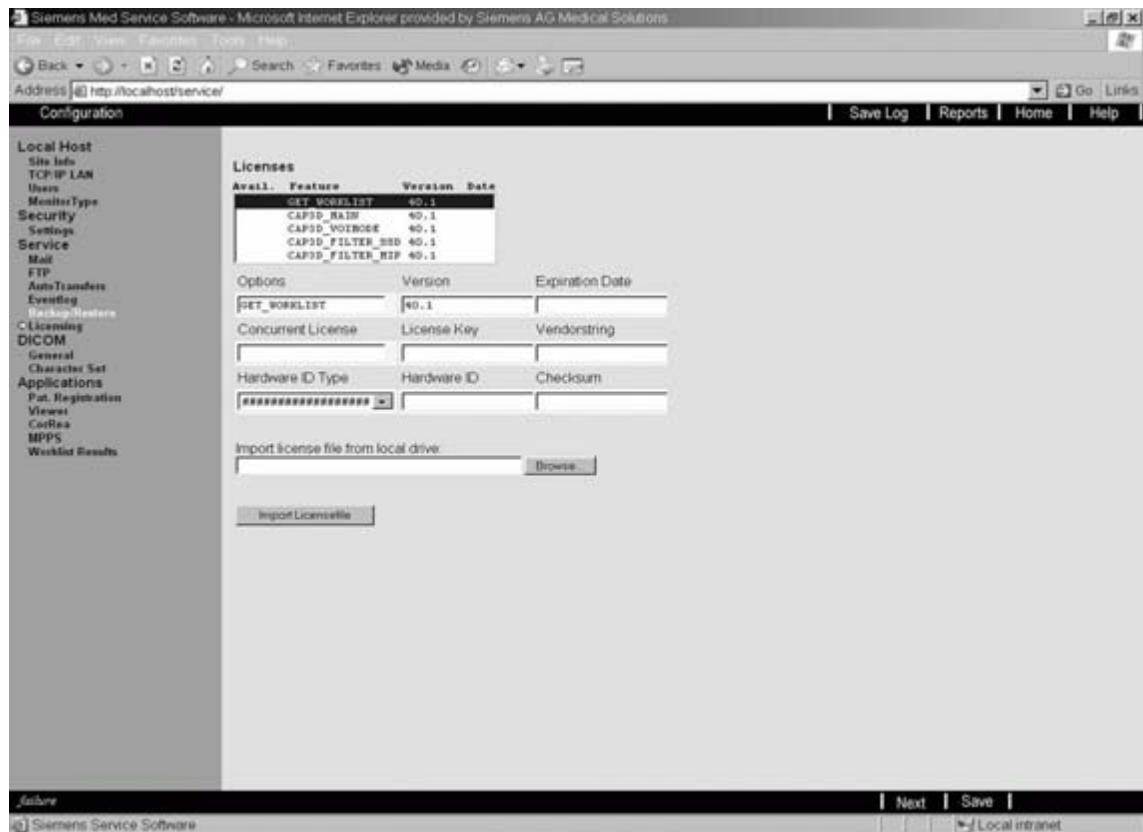
Fig. 10:   Service >> Licensing 1 (Inst)

- Under "Service" click the item "Licensing".

- Place CD with licenses in the CD-ROM drive and wait until the green lamp on the CD-ROM drive lights up, or insert floppy disk.

- Click "Browse".

- Select the license file on the CD or floppy disk.

- Click "Open".

  - The license file is displayed.

- Click on "Import Licensefile".

  ⇨ The following is displayed:
    "Are you sure you want to overwrite the existing license file?"

- Click "OK".

  ⇨ The following is displayed:
    "license data successfully saved"

- Remove CD or floppy disk.

DICOM Configuration

System network configuration

What follows is a check to see whether the system already has a network configuration.

Service software not opened

- Open syngo service software
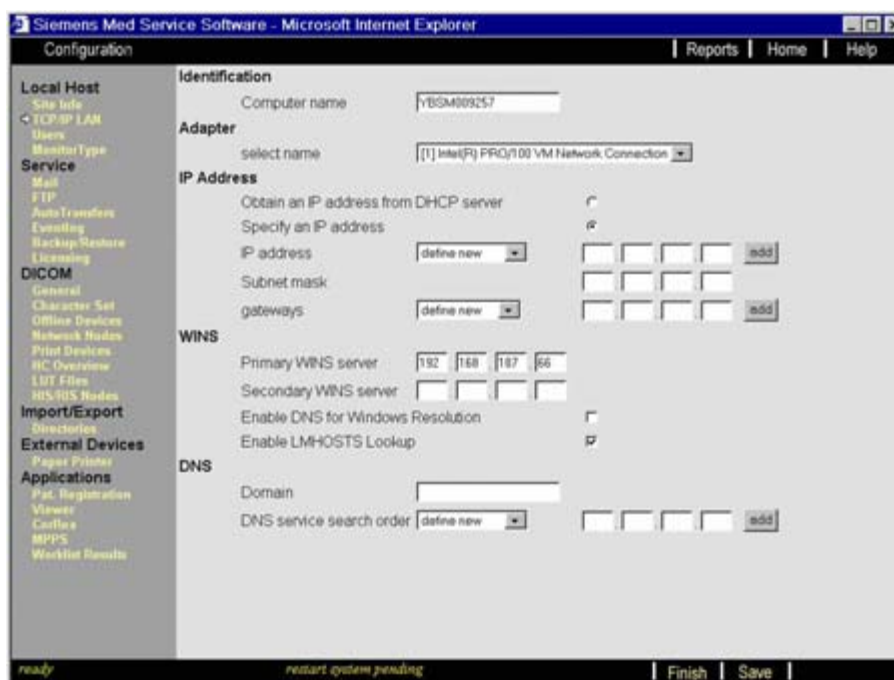- Click "Configuration".

Fig. 11: LocalHost_TCPIP

Service software opened

- Select "TCP/IP LAN" under "Local host"

Check IP address

- Click the selection window under "IP address".
- If the IP address 192.168.1.1 appears, delete it.

NOTE	If no other IP address is displayed, then the system has not yet been assigned its own IP address, and the following IP address should be assigned to it.
	If the system has already been assigned an IP address, then continue with the item "Navigation DICOM nodes".

NOTE	A system must never be configured with two IP addresses, since this can lead to software conflicts.

- Select "Specify an IP address".

NOTE	The system cannot be used with a DHCP server.

- Enter 192.17.3.110 as the IP address.
- Enter 255.255.255.0 as the subnet mask.
- Do not select "Enable DNS for Windows resolution".
- Select "Enable LMHOSTS lookup".

WINS
- Do not enter anything under "Primary WINS server".
- Do not enter anything under "Secondary WINS server".
- Do not enter anything under "Gateways".

DNS
- Do not enter anything under "Domain".
- Do not enter anything under "DNS service search order".

- Click "Save".
- Close the service software.
- Switch the system completely off and then back on.
  - This ensures that the configuration is completely saved within syngo.

Navigation DICOM nodes

A default DICOM node will now be configured for the navigation system.

This may be changed in consultation with the navigation systems vendor.

- Open syngo service software
- Click "Configuration".
- Click "Next".
- Under "DICOM", select "Network nodes".
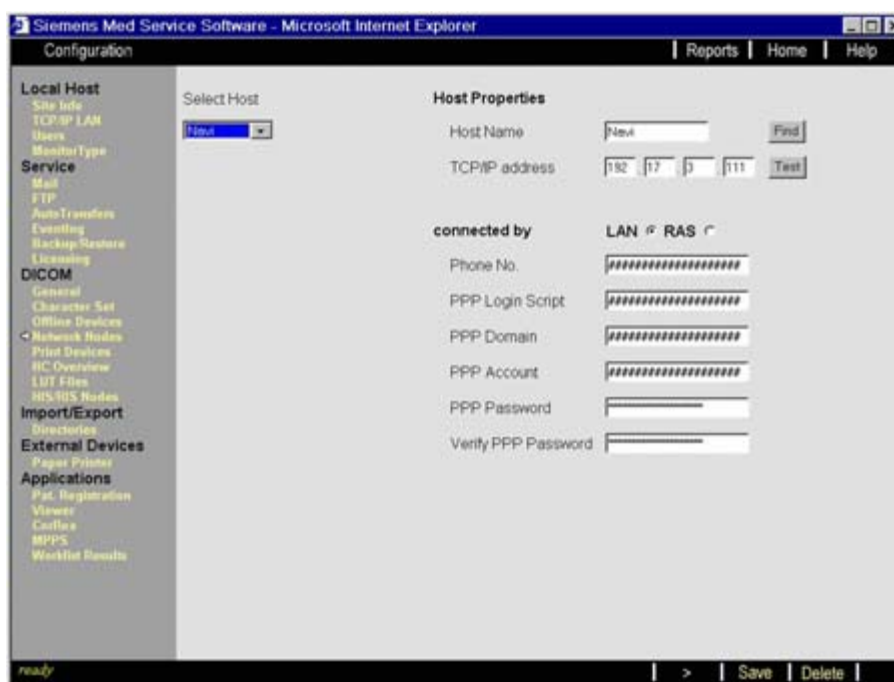
Fig. 12: Network_Navigation_1

- Under "Select host", select "Define new".

Host properties
- Under "Host name" enter "Navi".
- Under TCP/IP address enter "192.17.3.111".
- Click "Save".
    - ⇨ The following is displayed: "Host properties successfully saved".
- Click "OK".
- Select ">".

SIREMOBIL Iso-C 3D   SPR2-230.814.03.02.02
                                 11.05   Page 26 of 52   Siemens AG
                                                             CS SD 24   Medical Solutions

Fig. 13: Network_Navigation_2
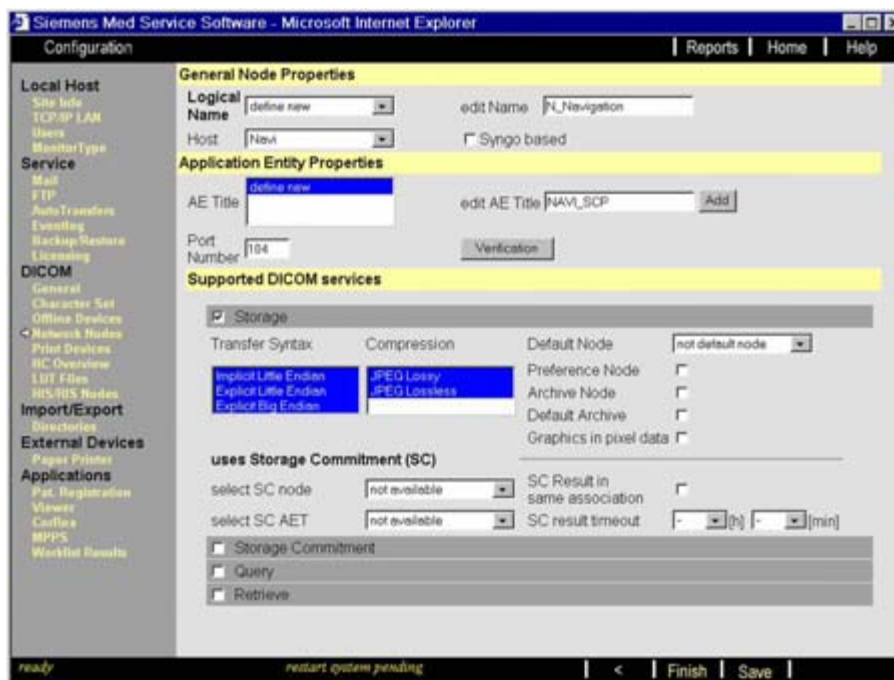
General Node Properties

- Under "Logical name", select "Define new".
- Under "Edit name", enter "N_Navigation".

NOTE	Only when the "Logical name" begins with "N_" does the navigation configuration appear in the calibration screen.

- Under "Host", select the name "Navi".

Application entity properties

- Under "AE title", select "Define new".
- Under "edit AE Title", enter "NAVI_SCP".
- Under "Port number", enter "104"

Supported DICOM services

- Select "Storage".
- Do not make any changes under "Storage".
- Click "Add".
- Click "Save".
    - ⇨ The following is displayed: "DICOM node properties successfully saved".
- Click "OK".

Siemens AG
Medical Solutions
SPR2-230.814.03.02.02
11.05
Page 27 of 52
CS SD 24
SIREMOBIL Iso-C 3D

- Click "Home".
  - ⇨ The following is displayed: "A restart of application SW is necessary to make changes valid"
- Click "OK".
- Wait until the application SW has restarted.
- Switch the system completely off and then back on.
  - All configuration data is thus saved within syngo.

Positioning

- Take the stand out of the "Calibration Phantom Service Case".
- Attach the calibration phantom to the stand.

Systems equipped with a laser light localizer

- Position the calibration phantom in the C-arm.

Fig. 14:   Navigation_calibration_phantom

- Using the light laser localizer, align the C-arm correctly with respect to the markings on the calibration phantom, first in the vertical and then in the horizontal C-arm position.

Fig. 15: 02_Positioning_calibration_phantom

Fig. 16: 03_Positioning_calibration_phantom

Systems not equipped with a laser light localizer

- Position the calibration phantom in the C-arm.

- Align the C-arm correctly with respect to the markings on the calibration phantom, first in the vertical and then in the horizontal C-arm position.

  To this end, release a brief exposure and check the position of the C-arm with respect to the calibration phantom.

SIREMOBIL Iso-C 3D   SPR2-230.814.03.02.02
11.05

Page 30 of 52
CS SD 24

Siemens AG
Medical Solutions

Checking the positioning

- Check that the calibration phantom is positioned in the isocenter. To do so, check both the horizontal and vertical adjustment at least twice.

  ⇨ When the calibration phantom is positioned correctly, the points of the ball pattern will not be visible at the upper and lower image edges.
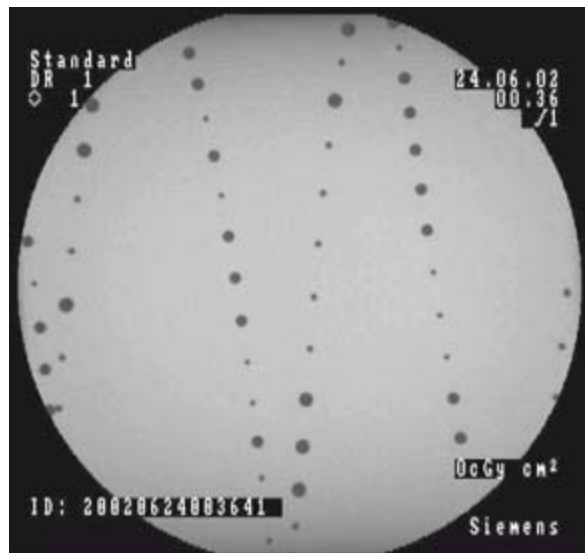   See illustration below.

Fig. 17:   adjustment

Calibration

NOTE	**Here, perform only the calibration without the image intensifier navigation marker ring.**
	The calibration with the image intensifier navigation marker ring is performed by a trained BrainLAB technician.

- Press the key combination "Ctrl-D" on the MEMOSKOP keyboard to switch over to 3D operation.
- Open syngo service software.
- Click "Calibration Iso-C 3D".

Fig. 18:   Calibration_unit_fix

- Select "No".
- Click ">".

NOTE	**Depending on the number of configured navigation systems, these appear in the calibration screen. A maximum of three navigation systems is possible.**

- Under "Reset calibration data", click "Reset".
    - ⇨ The following is displayed: "Reset all Calibration Data! Are you sure?"
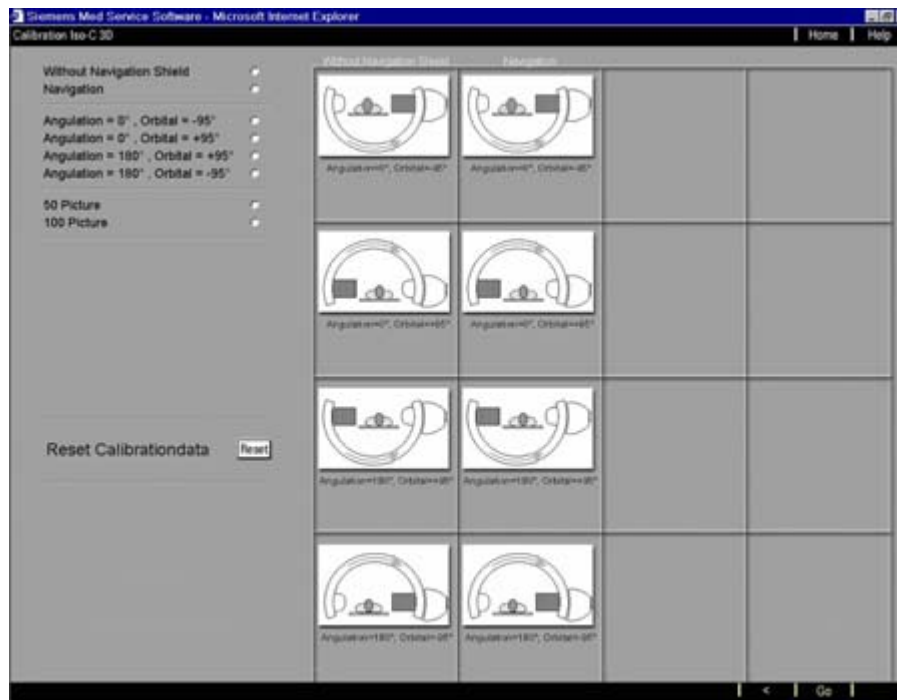- Click "OK".

Fig. 19: Calibration_1
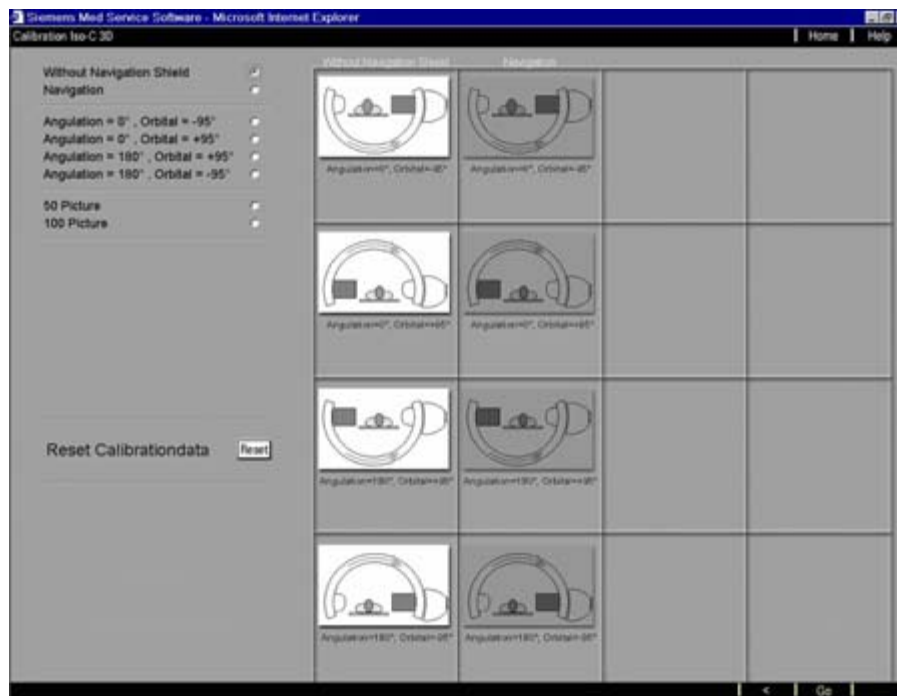
- Select "Without Navigation shield".

Fig. 20: Calibration_2

- Set C-arm position as given in setting no. 1 = "angulation 0 degrees and orbital -95 degrees."
    - Take note of the C-arm positions displayed.
- Select "50" as the number of images, as given in setting no. 1.
- Click the "Go" button.
- Press the left footswitch and hold it down until "Calibration successful" is displayed.
    ⇨ The system automatically starts a measurement run.
- Click "OK" after "Calibration successful" is displayed.
- Perform this procedure for each of the settings given in the table below.

Tab. 1

| Perform these settings successively	Setting	Number of images
No. 1	Angulation = 0 degrees Orbital = -95 degrees	50
No. 2	Angulation = 0 degrees Orbital = +95 degrees	50
No. 3	Angulation = 0 degrees Orbital = -95 degrees	100
No. 4	Angulation = 0 degrees Orbital = +95 degrees	100
Intermediate step	At setting no. 5, recheck the adjustment of the calibration phantom.	n.a.
No. 5	Angulation = 180 degrees Orbital = +95 degrees	50
No. 6	Angulation = 180 degrees Orbital = -95 degrees	50
No. 7	Angulation = 180 degrees Orbital = +95 degrees	100
No. 8	Angulation = 180 degrees Orbital = -95 degrees	100
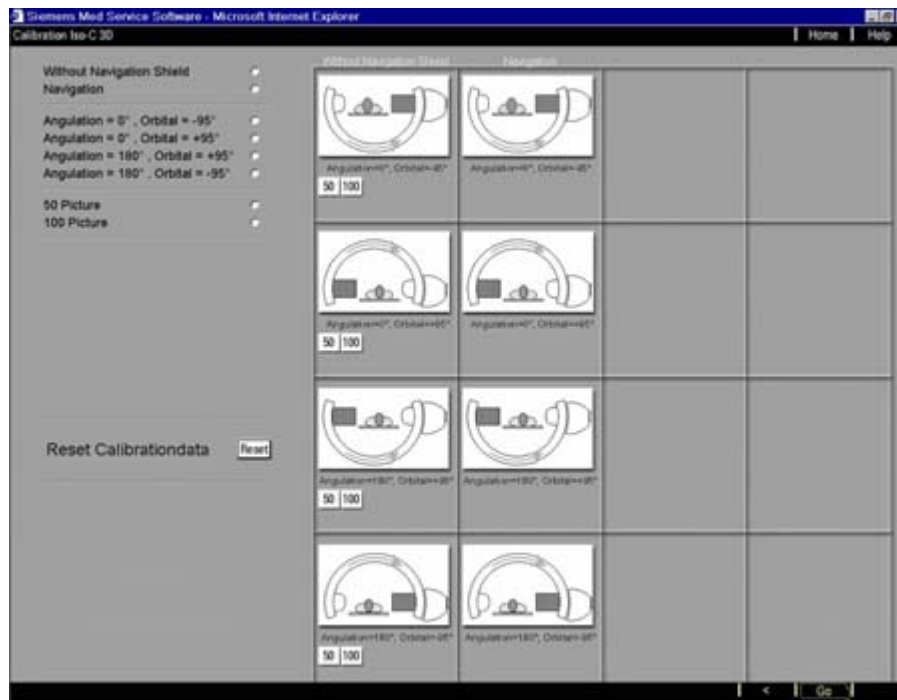
Fig. 21: Calibration_finish

- Click "Home".
- Close the service software.

| NOTE | **This completes the calibration procedure.** |

Image quality test

Preparation

- Move the C-arm into the neutral horizontal position.
  - The image intensifier is on the main unit.
- Take the required stand out of the "Calibration Phantom Service Case".
- Attach the resolution test (lead strip test pattern) to the stand so that it is horizontal to the floor.
- Position the resolution test in the isocenter of the C-arm. Navigate from the side and longitudinal to the C-arm.
- Use the laser light localizer (if one is installed) to aid in locating the isocenter.
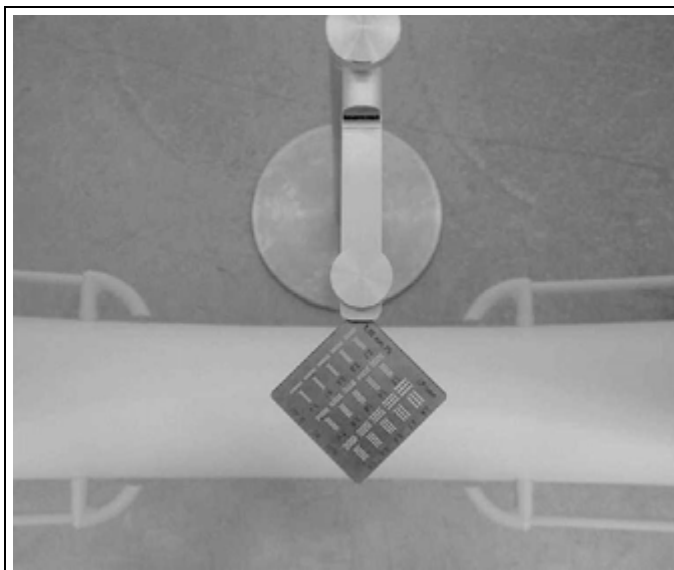

Fig. 22:   Test_set-up_side_view

Fig. 23:   Test_set-up_top_view

Testing procedure

- Press the key combination "Ctrl-D" on the MEMOSKOP keyboard to switch over to 3D operation.

  ⇨ syngo screen appears on right-hand monitor
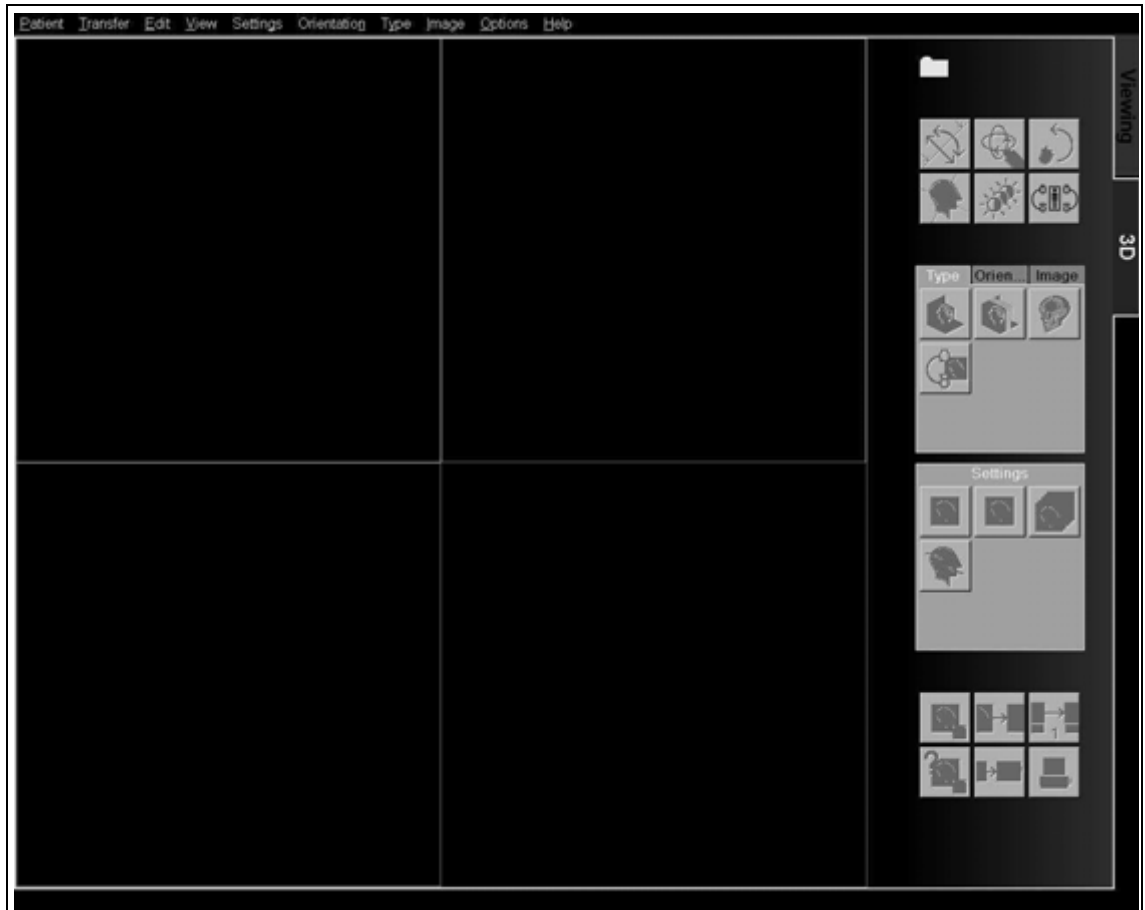

Fig. 24: syngo_start_screen

- Select the 3D task card
- Click "Acquisition ISO-C 3D".
  - This is the button with the two C-arms and the figure in the middle, in the upper right button block.
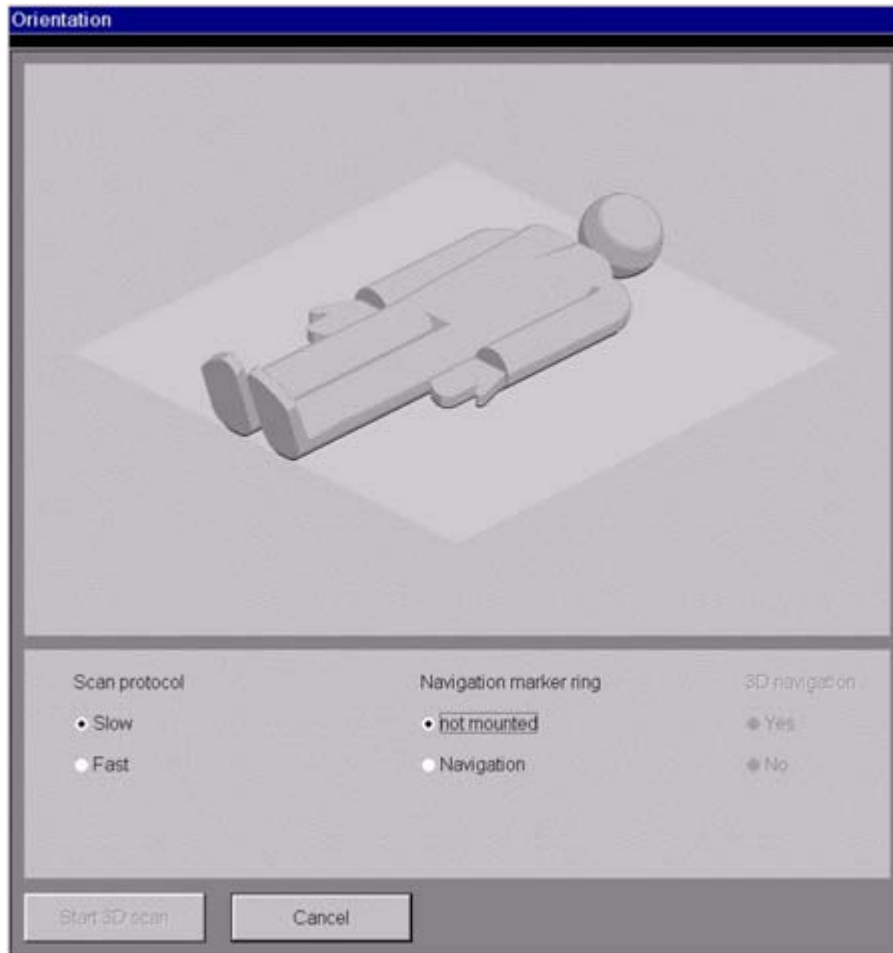
Siemens AG
Medical Solutions
SPR2-230.814.03.02.02
11.05
Page 37 of 52
CS SD 24
SIREMOBIL Iso-C 3D

Fig. 25: scan_1

- Click on a leg.
- Under "Scan protocol", click "Slow".
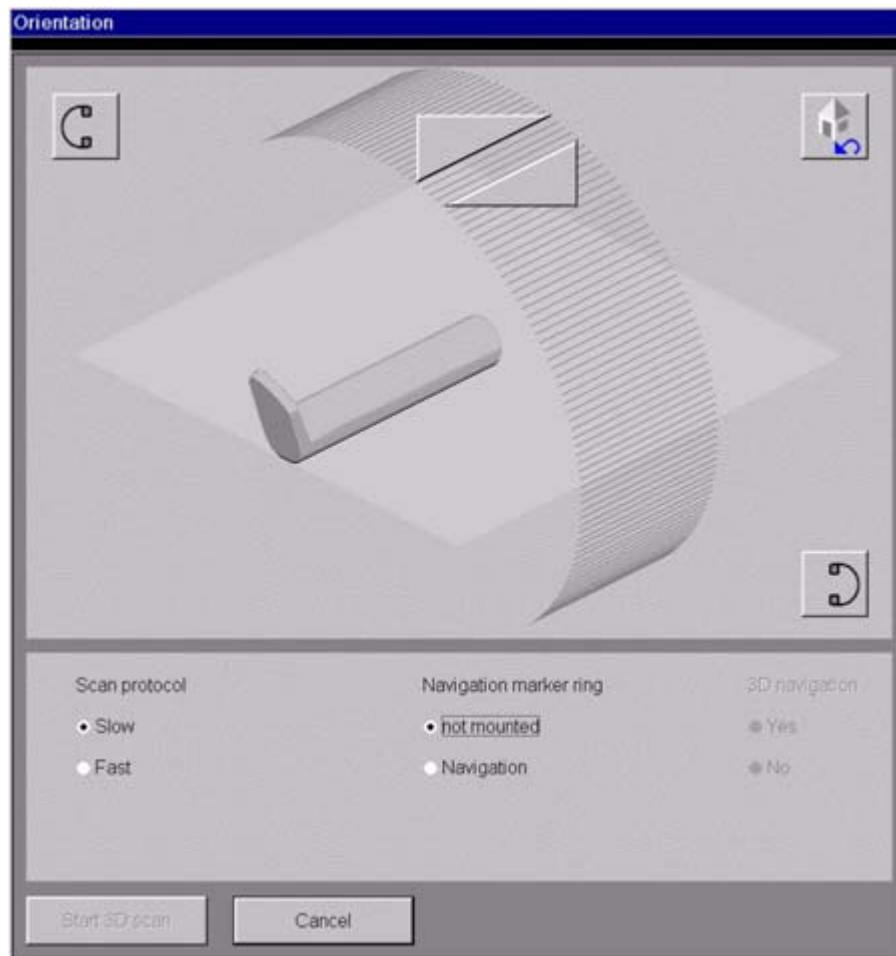- Under "Navigation marker ring", select "not mounted".

Fig. 26: scan_2

- For orientation, click the right-hand button.
  - This is the button with the C-arm.
    ⇨ Doing so activates the "Start 3D scan" button.

Siemens AG
Medical Solutions

SPR2-230.814.03.02.02
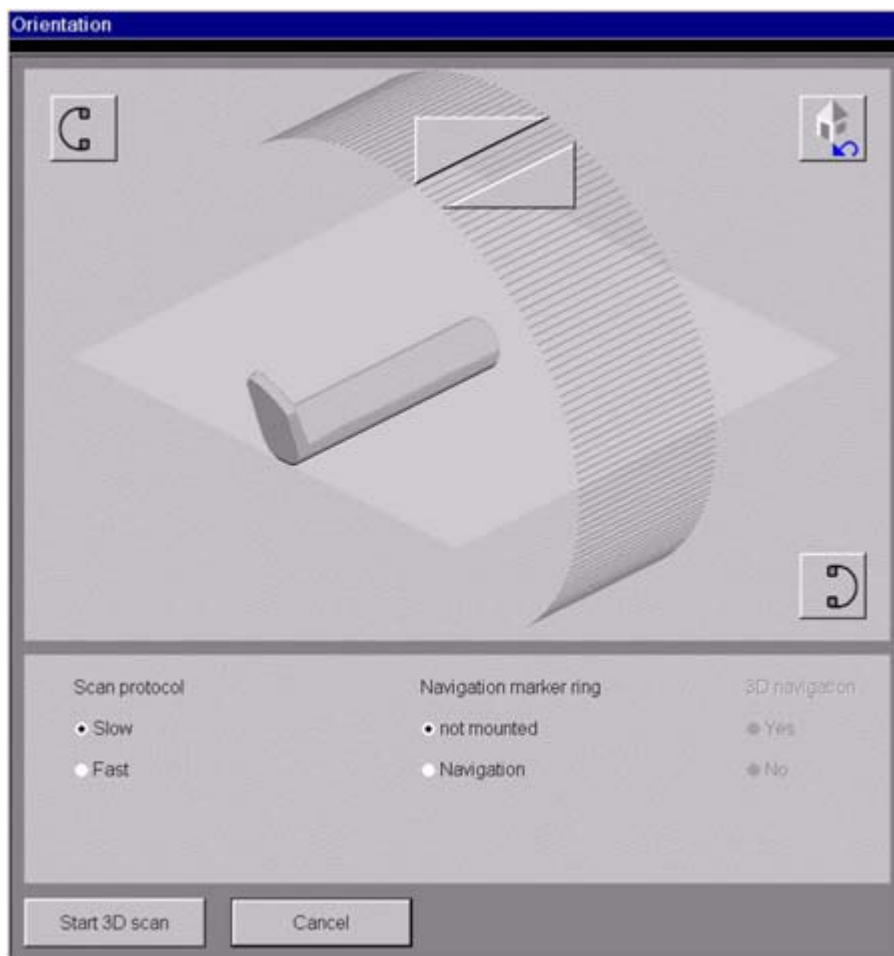11.05

Page 39 of 52
CS SD 24

SIREMOBIL Iso-C 3D

Fig. 27:   scan_3

- Click "Start 3D scan".

Fig. 28: START1

- Manually move the C-arm to the end position (into the limit switch).
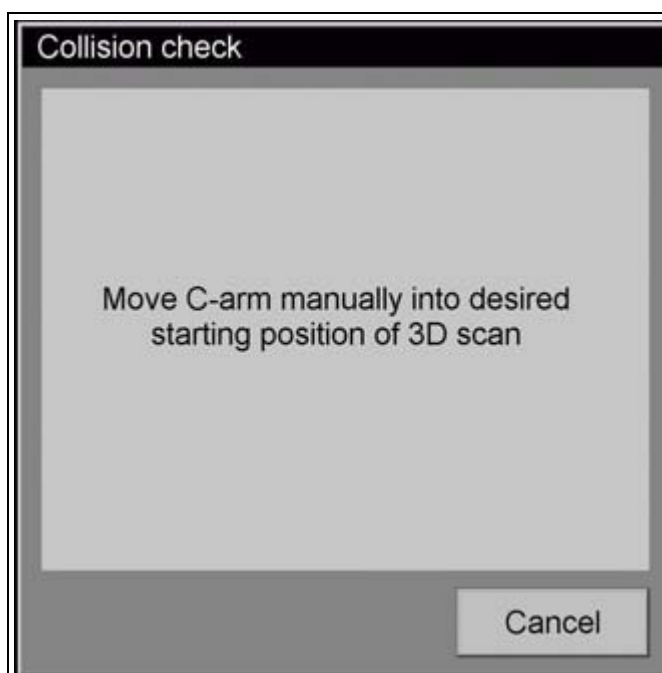 - X-ray tube located on main unit.

Fig. 29: START2

- Manually move the C-arm to the start position (into the limit switch).
  - Image intensifier tube located on main unit.

⇨ The following window appears following a successful manual test run.

Fig. 30: EXECUTE

Measurement run

- Start 3D measurement with left footswitch.

- Keep foot on footswitch for approx. 2 minutes.

- While doing so, check the left (SIREMOBIL) monitor to see whether the lead strip test pattern is located in the isocenter; visible modulations (~ at a projection of 50) of up to 1.8 LP/mm should appear.

    - The lead strip test pattern must be positioned in the center of the monitor image.

NOTE	If there is a significant deviation from the isocentric object position, the measurement will be interrupted and the lead strip test pattern must be repositioned.

During the scan, the following window is displayed:

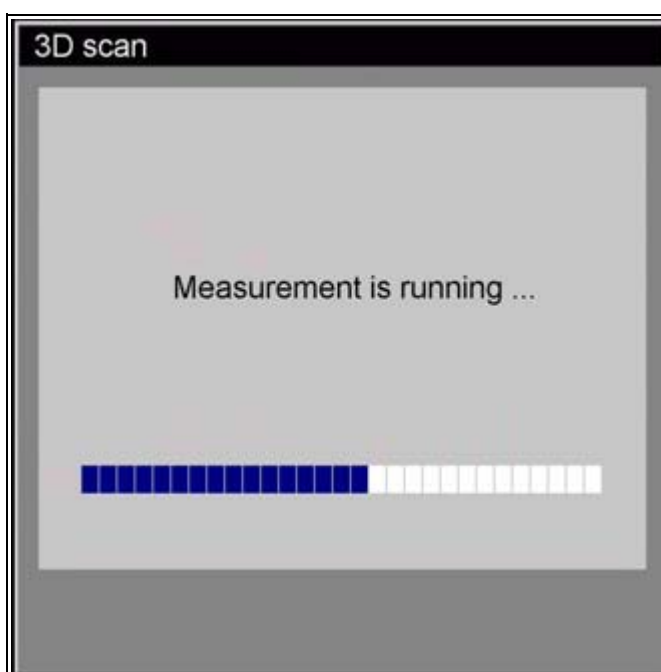*Fig. 31:   MEASURE2*

..

The following window appears following a successful measurement:

Fig. 32: DONE

- Remove foot from the footswitch.
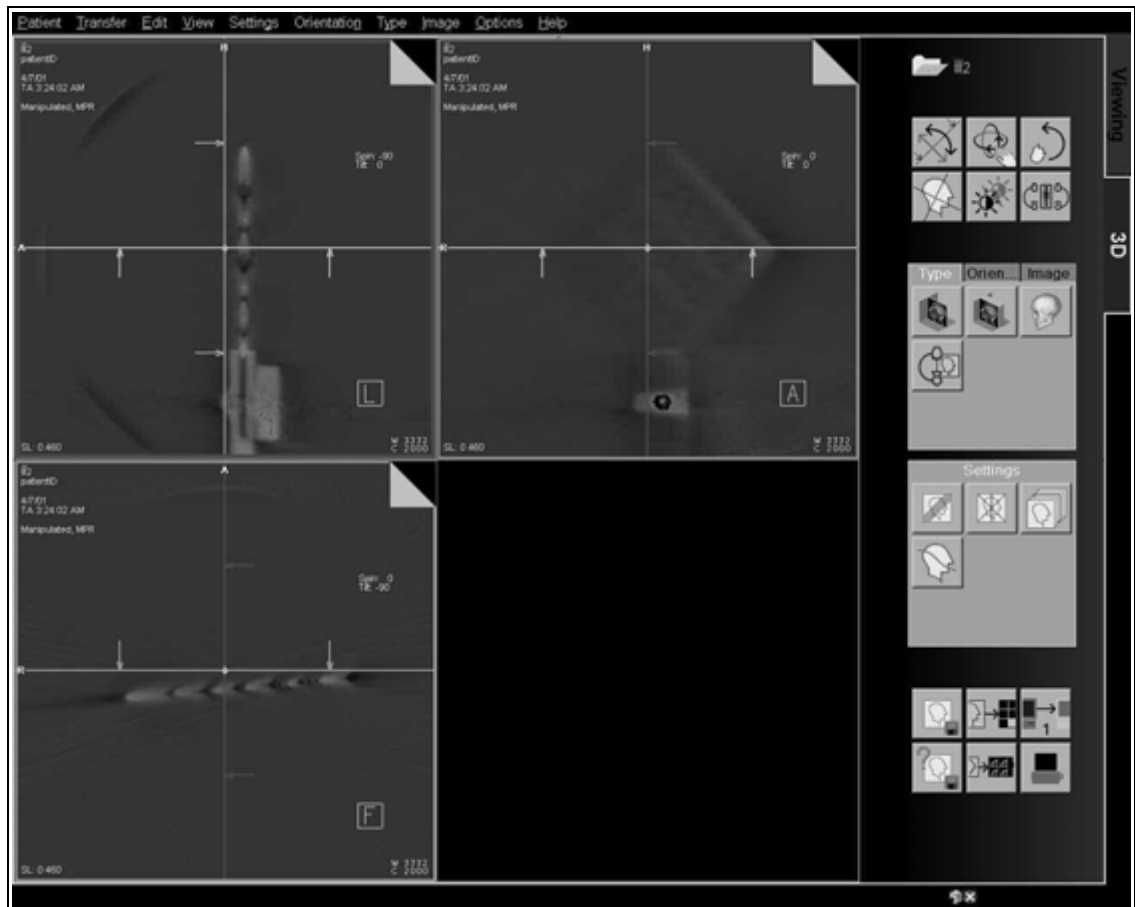   ⇨ At the end of the measurement, the reconstructed volume automatically appears in the 3D card.

Fig. 33:   syngo_screen_after_successful_data_input

Siemens AG
Medical Solutions

SPR2-230.814.03.02.02
11.05

Page 45 of 52
CS SD 24

SIREMOBIL Iso-C 3D

Checking 3D high resolution

Target:

Determine the optimal slice plane for representing the lead strip test in the syngo window.

In upper left-hand window:

- Using the vertical bar, select the plane perpendicular to the lead strip test pattern.
- Next, select a slice plane in the center of the lead strip test pattern.
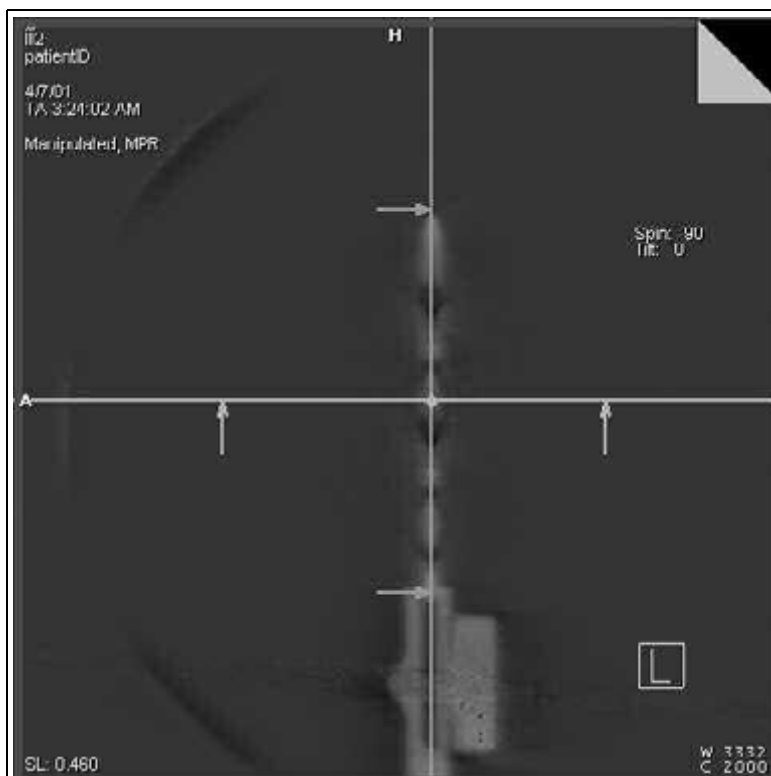
Fig. 34:   Slice_plane_setting_in_upper_left_window

- If the lead strip test pattern is slanted in relation to the floor plane, correct this by rotating the slice plane in Free Mode.

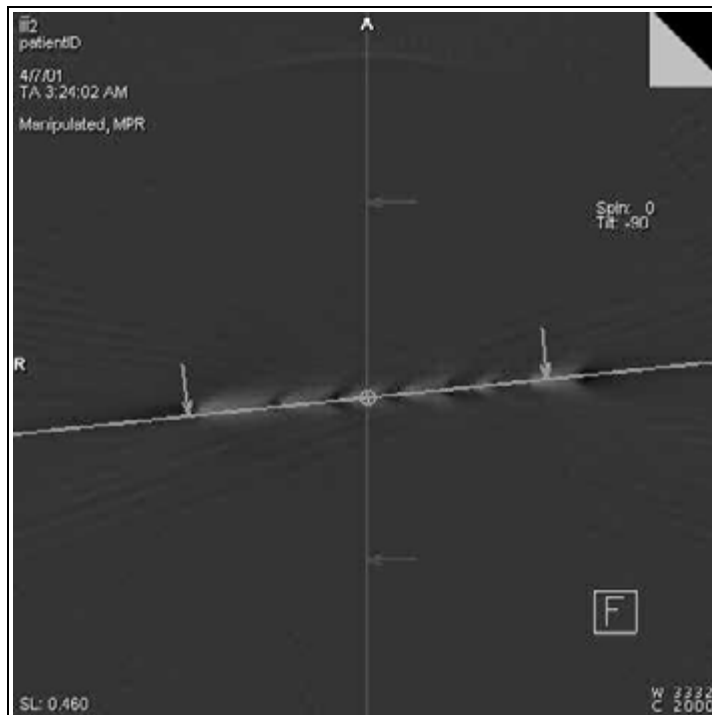*Fig. 35:   Slice_plane_rotation_in_lower_left_window*

⇨ A syngo image should display a plane parallel to the lead strip test pattern.
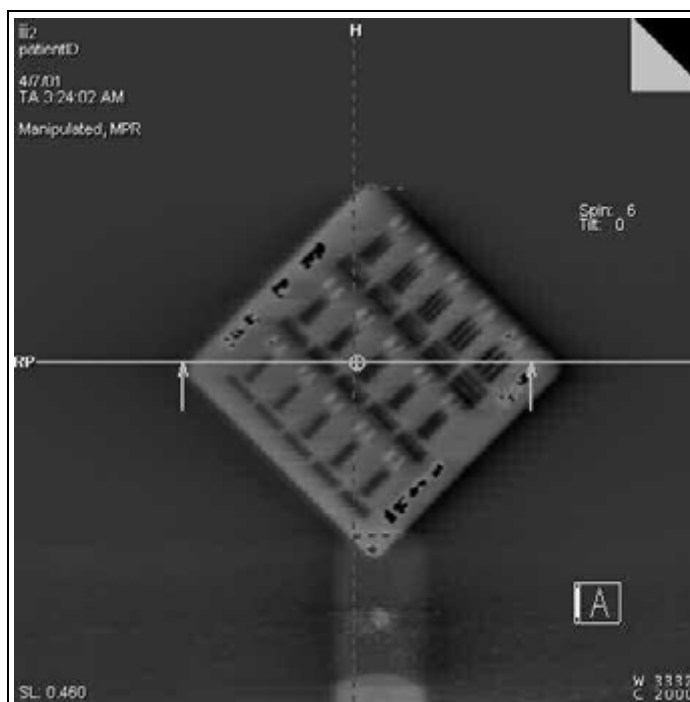
Fig. 36:   slice_parallel_to_lead_strip_test_pattern_in_upper_right_window

• Double-click this image.

⇨ A full-field image is displayed.

- Check the 3D high resolution (1LP/mm). It may be necessary to use the appropriate mouse button to return to a previous window.

NOTE	**If 3D high resolution is not achieved, the calibration must be performed again.**

Notify BrainLAB

- Fill out the fax form contained in the attachment.
- Fax it to the appropriate organizational unit at BrainLAB.
  - This notifies BrainLAB that the navigation system is ready to be installed.

NOTE	**From Siemens' perspective, this concludes the process of installing the BrainLAB navigation system.**

Concluding steps

- Create backup.
- File the new CDs and disk in the logbook.
- Remove the old 3D reconstruction license disk, since this is included in the 3D navigation license.

SIEMENS

Medical Solutions

BrainLAB AG
85551 Heimstetten / Germany
Fax-Nr. +49 89 991568-811

or

BrainLAB Inc., Chicago Office
60154 Westchester / United States
Fax-Nr. +1 708 409-1619

Name	....
Department	....
Telephone	....
Fax	....
E-mail	....
Date	....

To whom it may concern,
enclosed you will find the confirmation at the "Navi Link 3D Nav Interface" installation.

Hospital: ....

Department: ....

contact person from the Hospital...

System Serial number: ....

The follow activities are done:	o.k.
Hardware mounted	☐
License installed	☐
Network Nodes configured	☐
Calibration	☐
Image quality test	☐
Service key in the binder inserted	☐

Sincerely yours,

....

Fig. 37: FAX

Added items:

-Configuration

-Calibration

-Image quality test

Added differentiation between navigation systems vendor BrainLAB and other navigation systems vendors.